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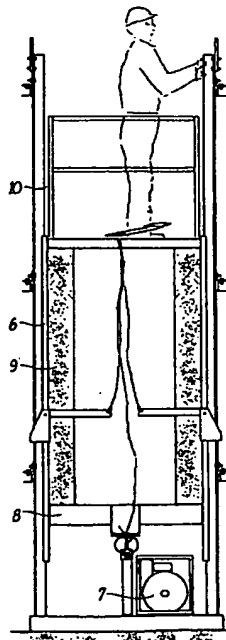
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- (84) Designated States (regional): **ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European**

[Continued on next page]

(54) Title: **METHOD FOR INSTALLING ELEVATORS**



(57) Abstract: The invention relates to a method for installing elevators, comprising the phases of: providing a suitable template that can be directly installed from footpace of the upper floor to lower the plumbs; fixing the bottom template; fixing the first bay of four guides and the first bracket group; fixing the cabin armature with the relevant safety blocks, installing the cabin floor and the second bracket group; mounting the cabin exploiting its roof as working plane; installing an auxiliary parachute apparatus; fixing the third group of anchorages and the connecting plates for the second guide bays; positioning the new lifting support beam between

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the two anchorages; fixing the following anchorages group and lifting the following second guide bay; lifting again the support beam of the lifting device, so that the cabin can be again lifted, and so on, until terminating the mounting the last guide bay.

METHOD FOR INSTALLING ELEVATORS

The present invention relates to a method for installing elevators.

5 More specifically, the invention relates to an innovative method for installing both oleo-dynamic and electric implants.

 Therefore, in the following specification, it will be made specific reference to the installation of electric implants, but it must not be used in a limitative way for the invention, since the inventive method could be
10 used also for oleo-dynamic implants without the need of substantial modifications.

 As it is well known, at present, for the installation of elevators it adopted a technique providing the preparation of a scaffold, within the elevator stroke opening, before starting the mounting process.

15 Otherwise, in particular cases, it is provided the use of scaffold fixed to the footpases of the building, always used on adjacent planes that substantially simulate the above mentioned scaffold.

 The above method involves different drawbacks, among which the fact that the mounting activity within the opening must be interrupted
20 after having placed the guides and having mounted the plane doors, to wait that the building yard operators provide the dismounting of the same scaffold.

 It involves a waste of time during the installation, with the consequent increase of costs.

25 In view of the above, it is suggested according to the present invention a method, the basic solution of which provides of carrying out the mounting of the elevator without using any scaffold, nor any hook from the ceiling of the opening, the latter not needing any more to be a supporting structure, being employed new, suitably created, devices to maintain
30 unmodified the safety during the installation procedure.

 It is well evident that the fact of not being obliged to break down the mounting activity within the opening after having placed the guides, to wait that the building yard operators dismount the scaffold, is a remarkable advantage, both for the reduction of the risks involved with the activity of
35 not specialist personnel within the stroke opening, this place being greatly subjected to dangers of falling down for persons and objects, and for the reduction of the installation time.

Furthermore, the solution suggested according to the present invention has the advantage of not requiring the use of hooks from the ceiling of the opening, so that a reduction of the risks during the working activity is obtained, as well as a reduction of the costs for the client.

5 It is therefore specific object of the present invention a method for installing elevators, comprising the phases of:

- providing a suitable template that can be directly installed from the footpace of the upper floor to plumb;
- fixing the bottom ditch template;
- 10 - fixing the first bay of four guides and the first bracket group;
- fixing the cabin armature (arcade) with the relevant safety blocks;
- fixing the device for the following motion of the arcade;
- installing the cabin floor and the second bracket group;
- 15 - mounting the cabin (except the wall on the guide side), exploiting its roof as working plane, after having fixed the parapets;
- installing an auxiliary parachute apparatus, provided with control mechanism;
- 20 - connecting the control lever of the standard parachute apparatus of the elevator with said control device, by a further rope;
- fixing the third group of anchorages and the connecting plates for the second guide bays;
- 25 - positioning the new lifting support beam between the two anchorages, in such a way to be able to move the cabin, lifting the same up to reaching the anchorages group;
- fixing the following anchorages group and lifting the following second guide bay, fixing the same after having plumbed;
- 30 - lifting again the support beam of the lifting device, positioning the same on the anchorages group just installed, so that the cabin can be again lifted, and so on, until terminating the mounting the last guide bay; and
- 35 - after having put under traction the implant by the traction ropes, prosecuting according to the standard mounting method.

According to the invention, it can be used a "unwinding" lightening system, from the upper to the lower floor, to lighten the stroke opening.

5 Preferably, according to the invention, said guides can have a standard length of 5 meters, the anchorages being fixed at a distance of 166 cm each other.

In case of implants requiring fixing points at a lower distance, according to the invention is possible employing further brackets.

10 Always according to the invention, said device for moving the arcade can be of the manual, electric or hydraulic kind.

Still according to the invention, said auxiliary parachute apparatus is realised in such a way to allow the upward motion of the cabin without requiring any action by the technician.

15 According to an embodiment of the method of the invention, said auxiliary parachute apparatus can be comprised of a pair of teeth able to rest, in case of malfunctioning of the parachute apparatus of the elevator, on the fixing brackets of the cabin guides.

20 Particularly, said teeth must be suitably sized to support the weight, during the motion, of arcade, cabin, materials to be lifted and operators.

Still according to the invention, said cabin is hooked to the new support beam, exploiting a traction hydraulic device or other device.

25 According to the invention, the auxiliary parachute has the function of second safety device only for the period during which the lifting apparatus is disconnected from the arcade to position it again on the upper bracket group just installed.

The present invention will be now described, for illustrative but not limitative purposes, according to its preferred embodiments, with particular reference to the figures of the enclosed drawings, wherein:

30 figure 1 is a first lateral view of support guides used with the method according to the invention;

figure 2 is a second lateral view of support guides used with the method according to the invention;

35 figure 3 is a top view of a first template used with the method according to the invention;

figure 4 is a top view of a second template used with the method according to the invention;

figure 5 shows a particular of the template of figure 4;

figures 6 and 7 show lateral views of some steps of the installation method according to the invention;

5 figure 9 is a top view of the auxiliary parachute apparatus of figure 8;

figure 10 is a further lateral view of an auxiliary parachute apparatus;

figure 11 is a top view of the auxiliary parachute apparatus of figure 10;

10 figure 12 is a lateral view of a safety bearing;

figure 13 is a top view of the safety rest of figure 12;

figure 14 is a lateral view of the fixing of the adjustment arm;

figure 15 is a top view of the fixing of the adjustment arm of figure 14;

15 figure 16 is a top view of a coupling beam of the safety bearing;

figure 17 is a lateral view of the coupling beam of the safety bearing of figure 16;

figure 18 is a lateral view of mounting fixture, provided with a hydraulic piston; and

20 figures 19, 20, 21 and 22 are lateral views of some steps of the installation according to the invention.

In the following, it will be described a method according to the invention, making specific reference to a kind of elevator, but it is well evident that the method as provided by the invention must be considered
25 in a general sense, which is defined by the enclosed claims.

Taking first into consideration the technical aspects on which the method of the embodiment shown in the figures is based, it is used a new kind of lightening, an "unwinding" lightening system, from the upper floor, to lighten the stroke opening, which is not a specific object of the
30 present invention, and therefore is not shown in the figures and is not described in greater detail.

For the mounting, (standard) guides, having length from 1 to 5 meters, are employed, with wall fixing brackets 2, placed, for example in the solution of figures 1 and 2, at a distance of 166 cm each other, except
35 for the first lower fixing at a distance of 143 cm from the ditch floor.

However, for implants requiring fixing at lower measures, it is always possible to use a further bracket, in case the offsetting of the

brackets brings to a situation for which no bracket is provided close to the coupling plate of the guides 1.

5 To lower plumbs 3, 4, not being available the scaffold, it is provided a suitable template 5 that can be directly installed from the footpace of the upper floor, as illustrated in figures 3, 4 and 5.

10 While executing the mounting according to the invention, they are fixed, in the following order, ditch bottom template, the first bay of four guides 1 and the first bracket 2 group, the cabin armature 6 (arcade) with the relevant safety blocks and the device for the following motion of the arcade that can indifferently be manual, electric or hydraulic (see figures 6 and 7).

15 Afterwards, it is installed the cabin plane 8 and the second bracket group 2. Then (instead of at the end of the mounting), it is immediately mounted the cabin 9, except for the wall corresponding to the guide 1 side, since the roof of the cabin 9, after having fixed the parapets 10, can be used as working plane, as well shown in figure 7.

20 Going on, it is installed an auxiliary parachute apparatus 11 (see particularly figures 8 and 9) comprised of a pair of teeth 12, that must be able to rest, in case of malfunctioning of the parachute of the elevator (not shown), on the fixing brackets 2 of the guides 1 of the cabin 9.

Said teeth 12 must be suitably dimensioned to support the weight, during the motion, of arcade 6, cabin 9, materials to be lifted and workers.

25 As it can be noted from the figures, the teeth 12 of the auxiliary parachute apparatus 11 are always in a potentially power takeoff position, since they work under gravity.

30 The teeth and the control lever of the standard auxiliary parachute apparatus of the elevator are operated, in such a way not to be anymore in a power takeoff condition by two pulling ropes 13, one of which allowing the return of the two teeth, and the other one unlocking the two parachute devices (one for each guide 1).

The above pulling device can be indifferently a pedal or manual control device.

35 The auxiliary parachute apparatus 11 is designed in such a way to allow the upward of the cabin 9, without any need of an action by the technician, thanks to a spring and counterweights system, that can be seen from figure 9, the same that, when the cabin 9 is stopped, automatically

blocks, under the only gravity effect, every downward movement, while allowing the upward motion when the back of the teeth 12 meets, ascending, the upper brackets 2.

5 Furthermore, the auxiliary apparatus 11 allows the lowering only by the action of the technician, acting on the manual or pedal control, so allowing the unlocking of the parachute and at the same time the lifting of the teeth 12 of the auxiliary parachute 11.

10 Further, the control lever of the standard parachute apparatus of the elevator is connected, by a further rope, to the same control device.; acting on the control, it will be at the same time possible both the unlocking of the parachute and of the auxiliary parachute 11.

15 Afterwards, in the method according to the invention, as shown in figures 16 and 17, the third group of anchorages and the coupling plates are fixed, for the second guide 1 bay, and it is positioned the new lifting support beam 13 between the two anchorages, hooking a traction hydraulic device 14, shown in figure 18, or any other device acting in this way.

Now, cabin 9 can be mounted lifting the same up to reaching the anchorages group.

20 As already mentioned, the auxiliary parachute 11 has the function of a second safety device, only for the period during which the arcade 6 lifting apparatus is disconnected, to position the same on the just installed upper bracket group 2.

25 During this period, in case of malfunctioning of the implant parachute apparatus, the auxiliary parachute 11 allows the descent of the cabin 9 only for the few centimetres separating the same from the anchorage bracket 2 of the just below guides 1.

30 After the motion of the arcade 6, it is possible fixing the following anchorages group and lifting the second guide 1 bay, fixing them after having been plumbed. These operations can be seen from figures 19 and 20, as well as in the following figures 21 and 22.

The support beam 13 of the lifting device can be again lifted and positioned on the just installed anchorages group 2, and cabin 9 can be lifted, and so on, until ending the mounting of the last guide bay.

35 As it is well evident, each possible lowering is realised actuating by the manual or pedal control, allowing the contemporaneous unlocking

of the parachute and of the auxiliary parachute 11, and the consequent actuation of the actuating device in the opposite direction.

Once the implant has been put under traction, by the traction ropes, going on with the mounting according the standard methods.

- 5 The present invention has been described for illustrative but not limitative purposes, according to its preferred embodiments, but it is to be understood that modifications and/or changes can be introduced by those skilled in the art without departing from the relevant scope as defined in the enclosed claims.

CLAIMS

1. Method for installing elevators, characterised in that it comprises the phases of:

- 5 - providing a suitable template that can be directly installed from the footpace of the upper floor to lower the plumb;
- fixing the bottom ditch template;
- fixing the first bay of four guides and the first bracket group;
- 10 - fixing the cabin armature (arcade) with the relevant safety blocks;
- fixing the device for the following motion of the arcade;
- installing the cabin floor and the second bracket group;
- mounting the cabin (except the wall on the guide side), exploiting its roof as working plane, after having fixed the
- 15 parapets;
- installing an auxiliary parachute apparatus, provided with control mechanism;
- connecting the control lever of the standard parachute apparatus of the elevator with said control device, by a
- 20 further rope;
- fixing the third group of anchorages and the connecting plates for the second guide bays;
- positioning the new lifting support beam between the two anchorages, in such a way to be able to move the cabin, lifting the same up to reaching the anchorages group;
- 25 - fixing the following anchorages group and lifting the following second guide bay, fixing the same after having been plumbed;
- lifting again the support beam of the lifting device, positioning the same on the anchorages group just installed, so that the cabin can be again lifted, and so on, until
- 30 terminating the mounting the last guide bay; and
- after having put under traction the implant by the traction ropes, prosecuting according to the standard mounting
- 35 method.

2. Method for installing elevators according to claim 1, characterised in that it is used a "unwinding" lightening system, from the upper to the lower floor, to lighten the stroke opening.

5 3. Method for installing elevators according to one of the preceding claims, characterised in that said guides have a standard length of 5 meters, the anchorages being fixed at a distance of 166 cm each other.

10 4. Method for installing elevators according to one of the preceding claims, characterised in that in case of implants requiring fixing points at a lower distance, it is possible to employ further brackets.

5. Method for installing elevators according to one of the preceding claims, characterised in that said device for moving the arcade is of the manual, electric or hydraulic kind.

15 6. Method for installing elevators according to one of the preceding claims, characterised in that said auxiliary parachute apparatus is connected by a rope to a pedal or manual control device.

20 7. Method for installing elevators according to one of the preceding claims, characterised in that said auxiliary parachute apparatus is realised in such a way to allow the upward motion of the cabin without requiring any action by the technician.

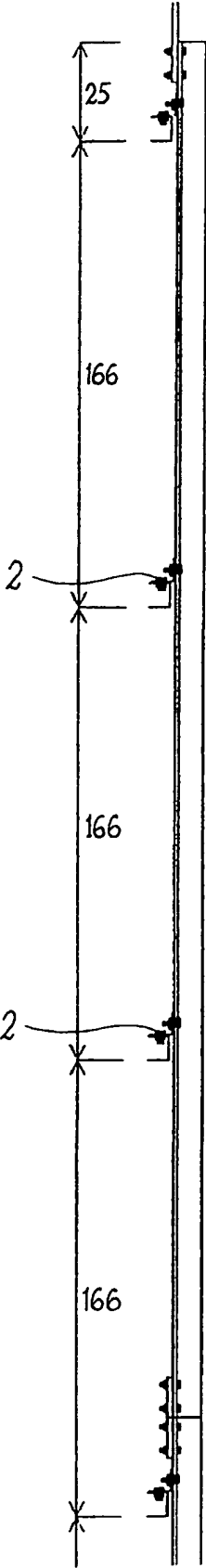
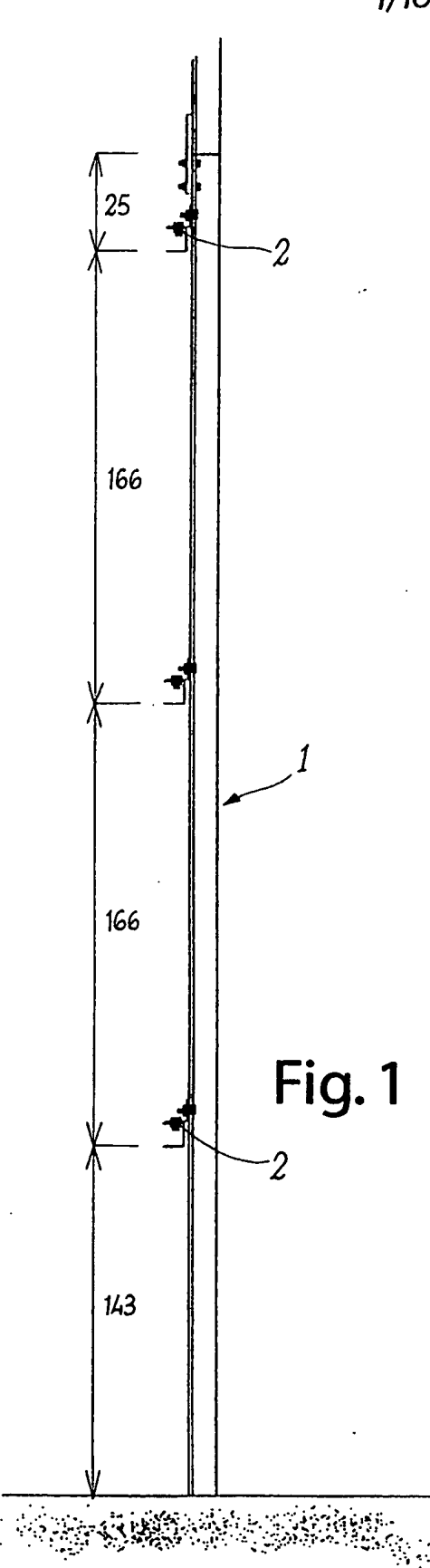
25 8. Method for installing elevators according to one of the preceding claims, characterised in that said auxiliary parachute apparatus is comprised of a pair of teeth able to rest, in case of malfunctioning of the parachute apparatus of the elevator, on the fixing brackets of the cabin guides.

30 9. Method for installing elevators according to one of the preceding claims, characterised in that said teeth are suitably sized to support the weight, during the motion, of arcade, cabin, materials to be lifted and operators.

10. Method for installing elevators according to one of the preceding claims, characterised in that said cabin is hooked to the new support beam, exploiting a traction hydraulic device or other device.

35 11. Method for installing elevators according to one of the preceding claims, characterised in that the auxiliary parachute has the function of second safety device only for the period during which the lifting apparatus is disconnected from the arcade to position it again on the upper bracket group just installed.

12. Method for installing elevators according to each one of the preceding claims, substantially as illustrated and described.



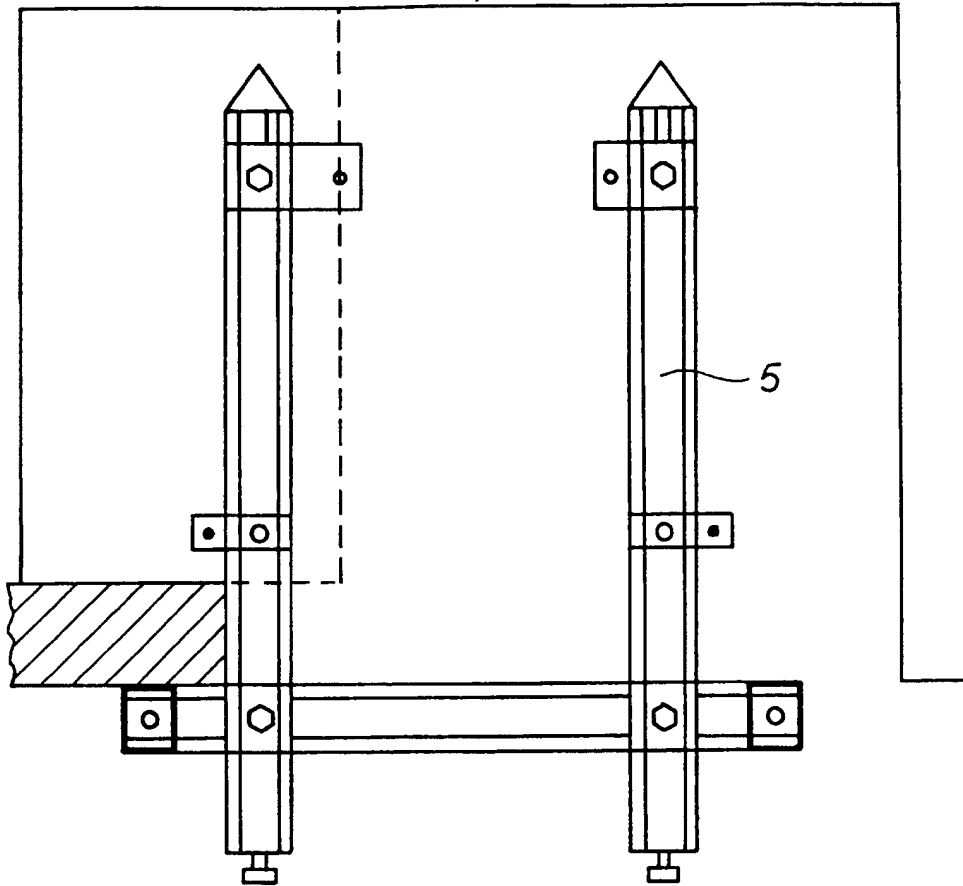


Fig. 3

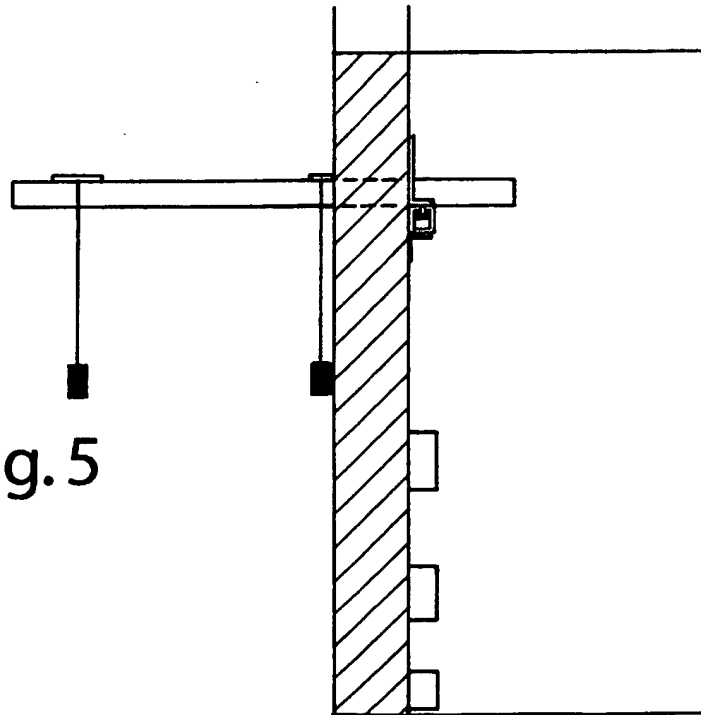


Fig. 5

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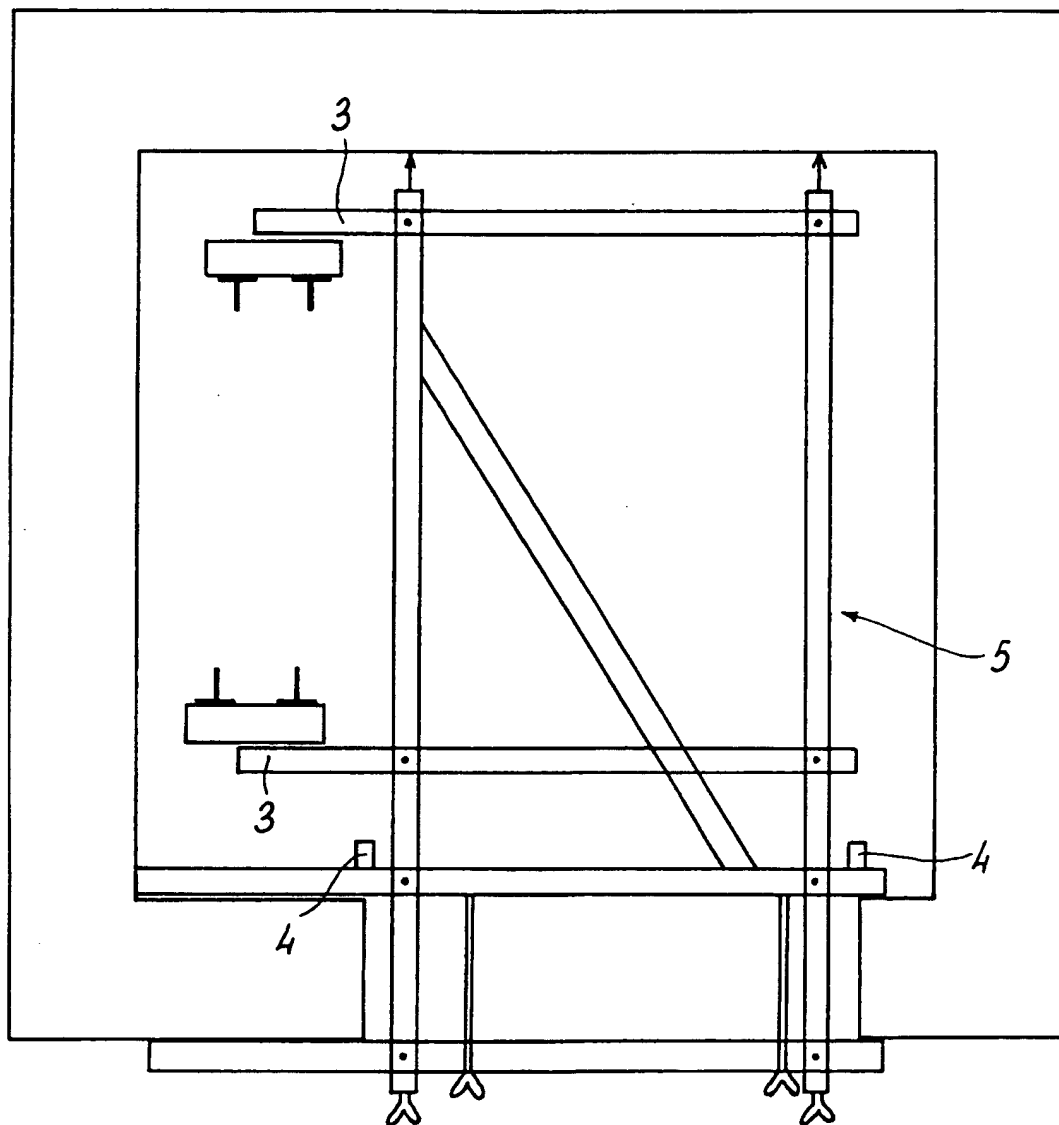


Fig. 4

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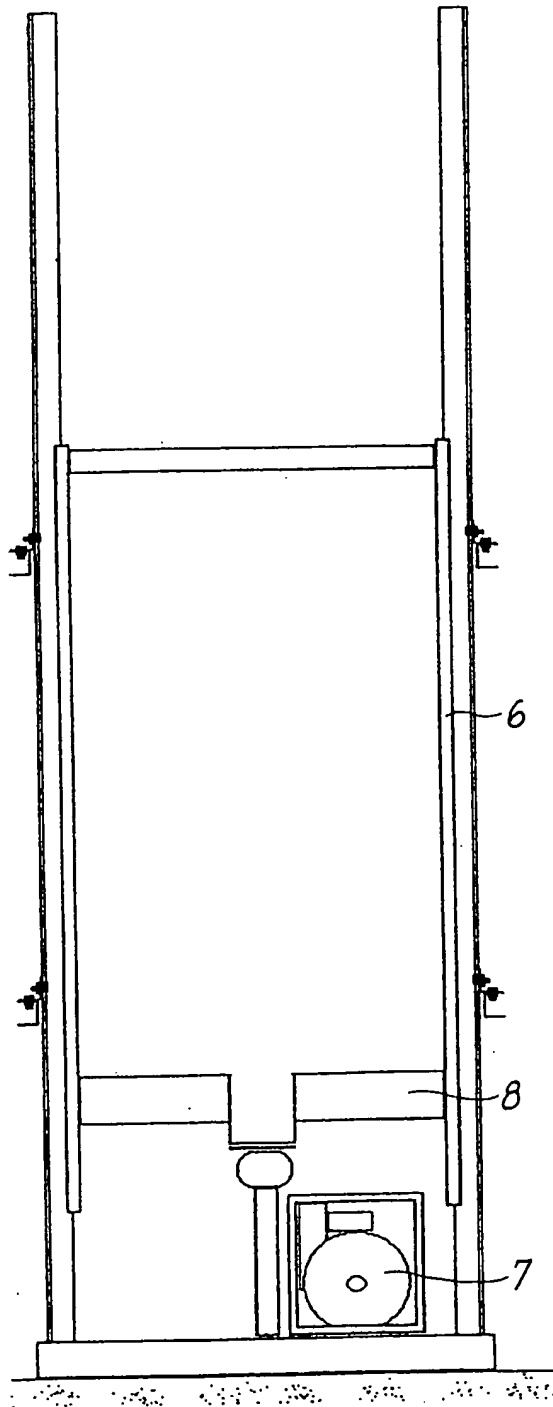


Fig. 6

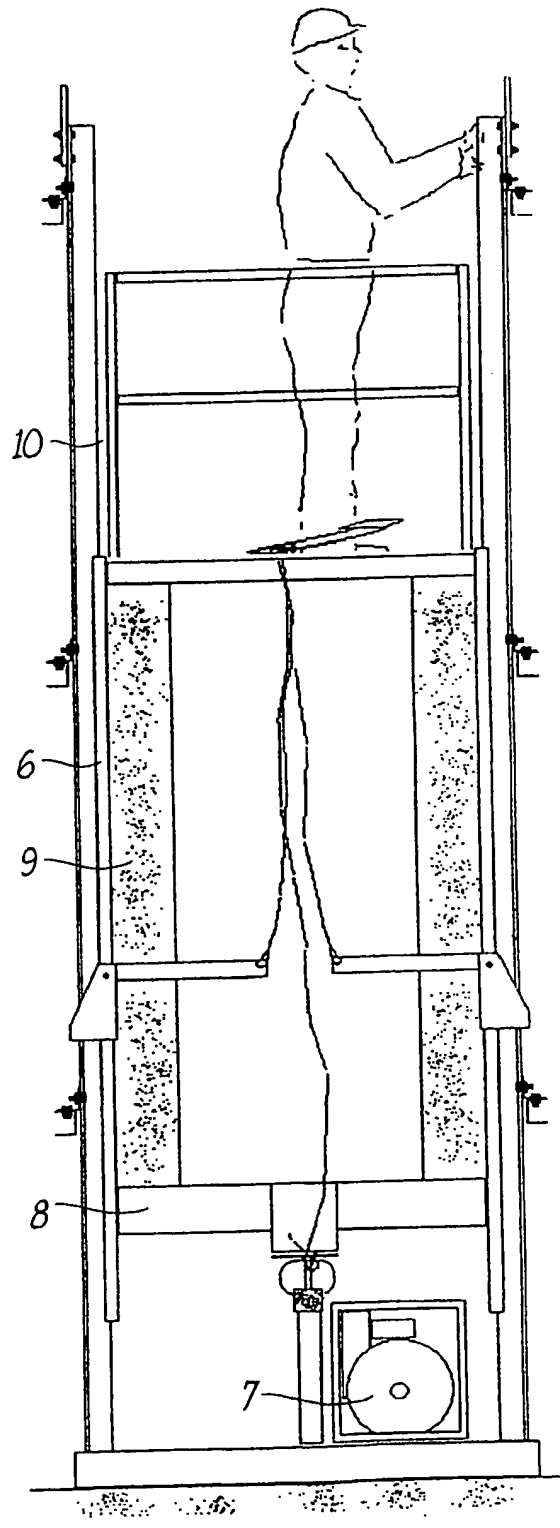


Fig. 7

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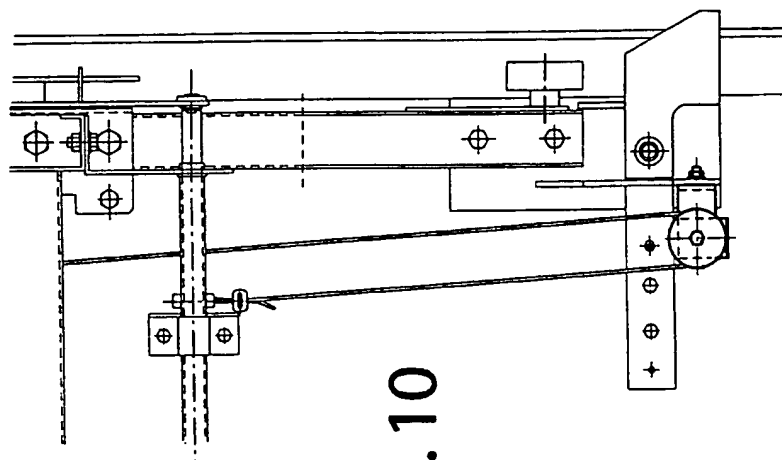


Fig. 10

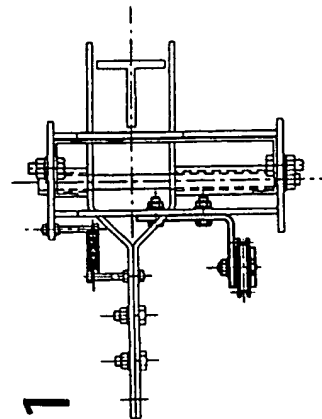


Fig. 11

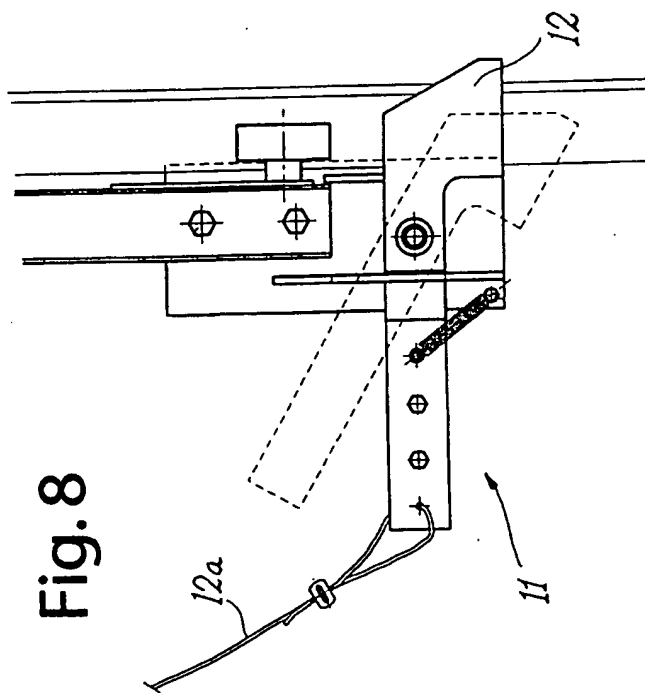


Fig. 8

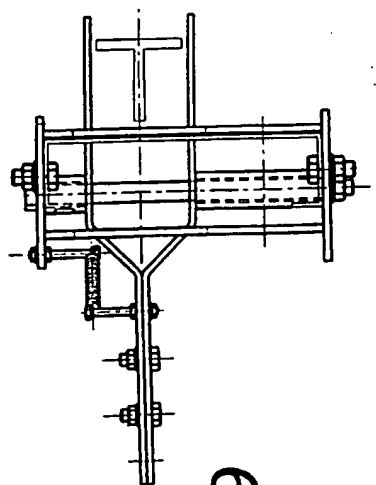


Fig. 9

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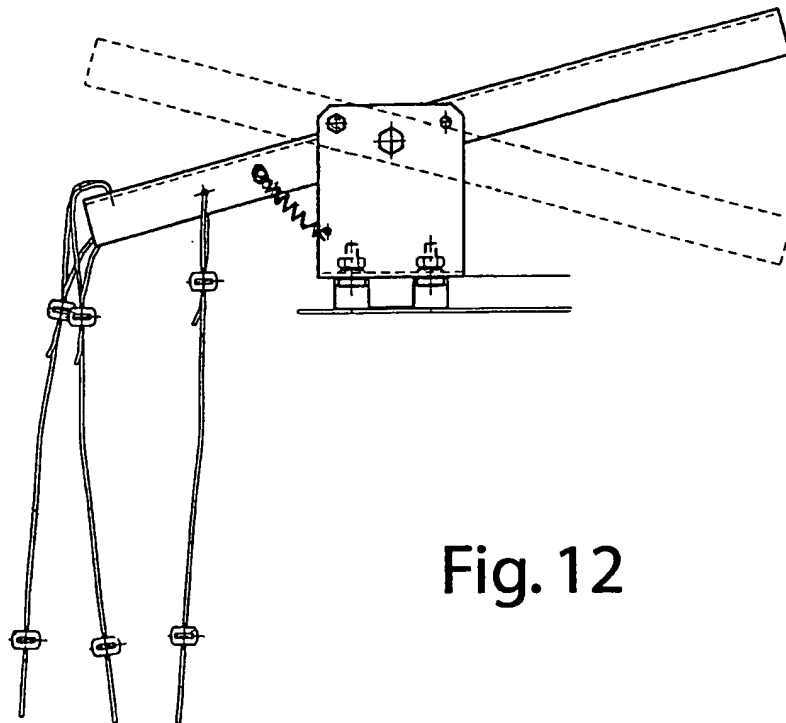
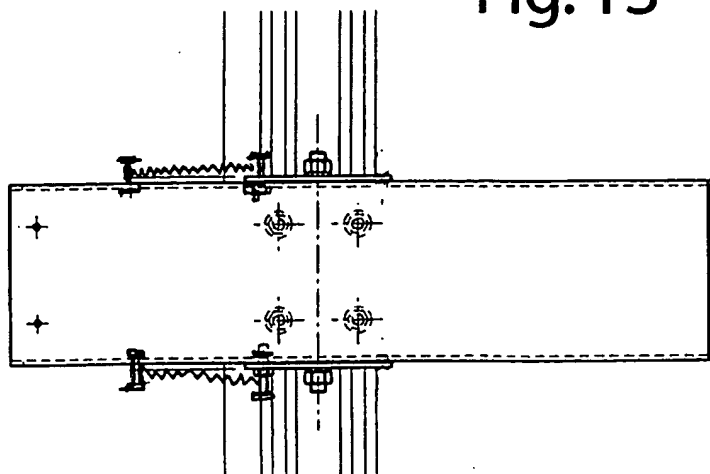


Fig. 12

Fig. 13



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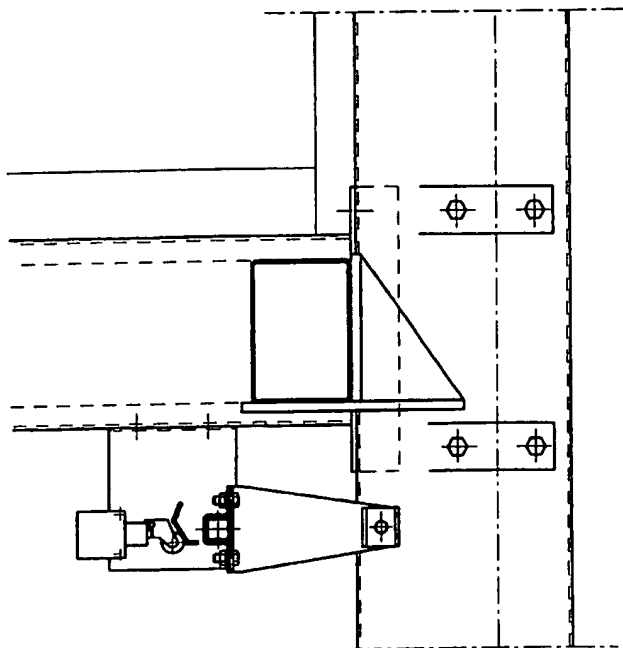


Fig. 14

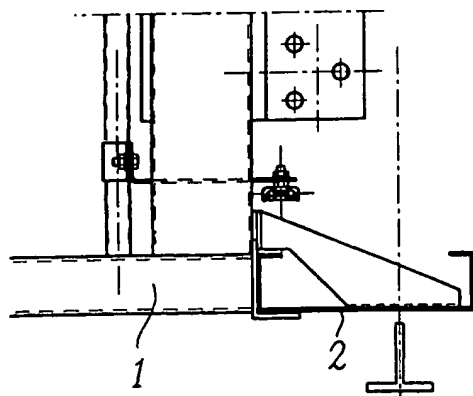


Fig. 15

Fig. 17

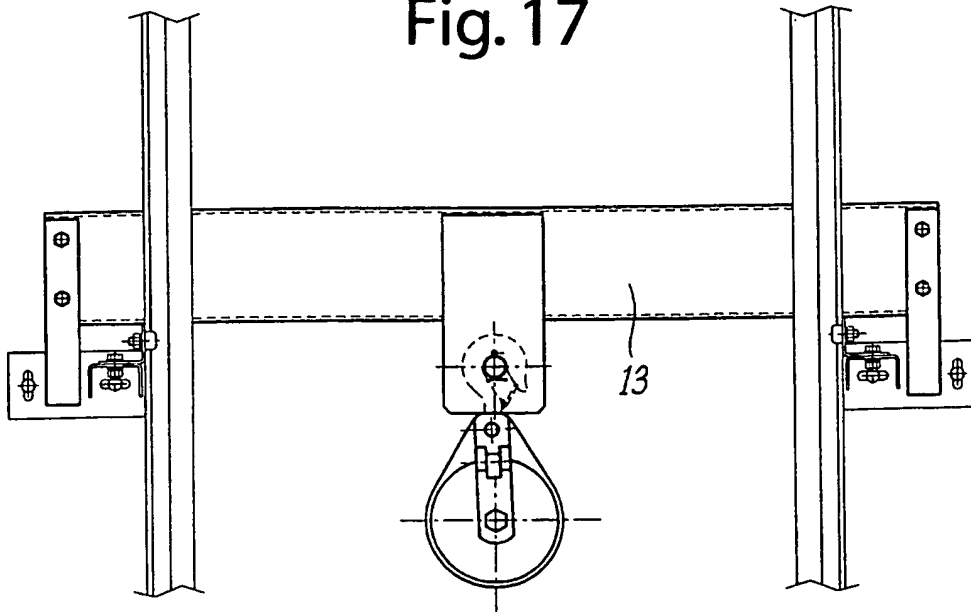


Fig. 16

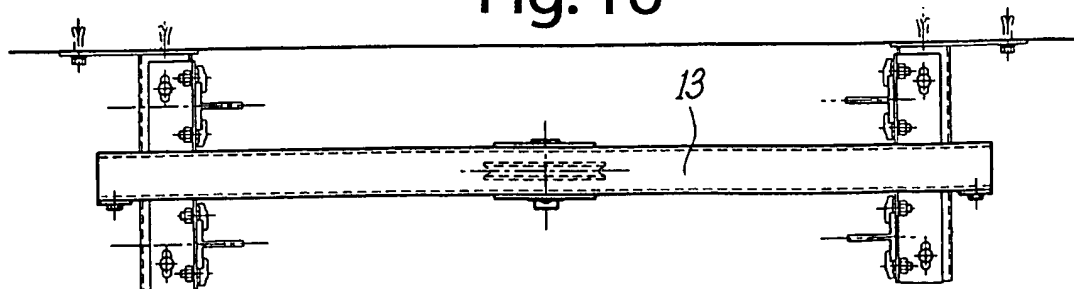


Fig. 18

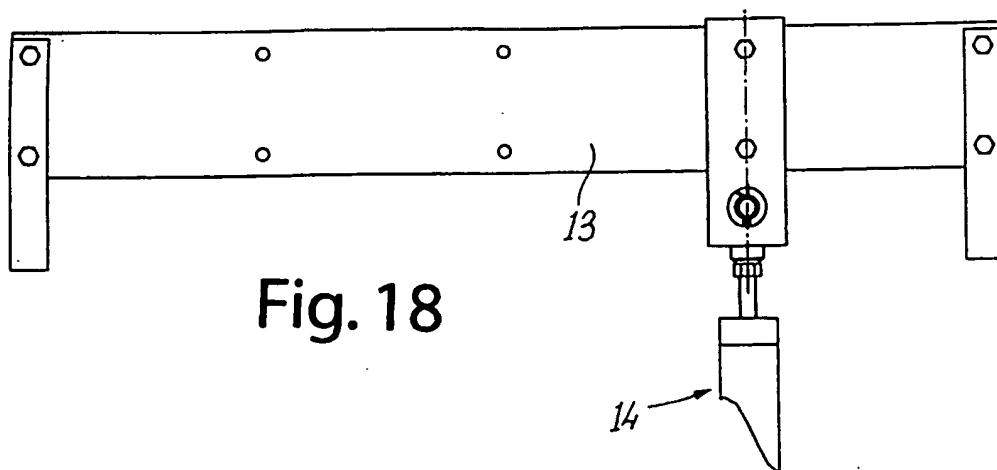
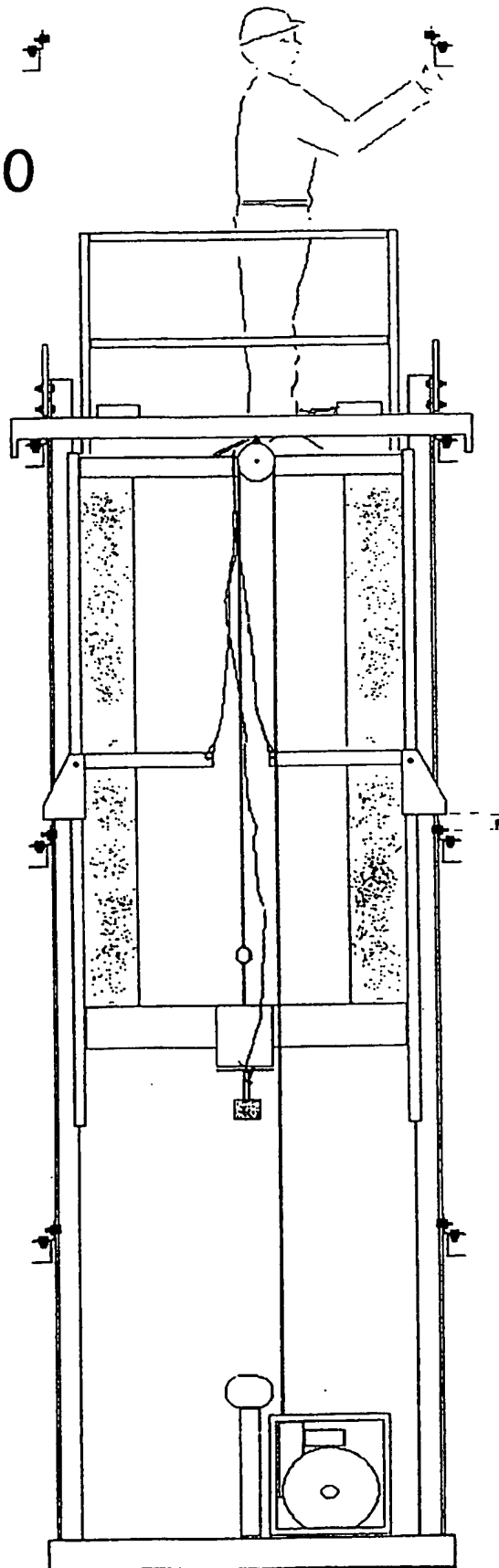
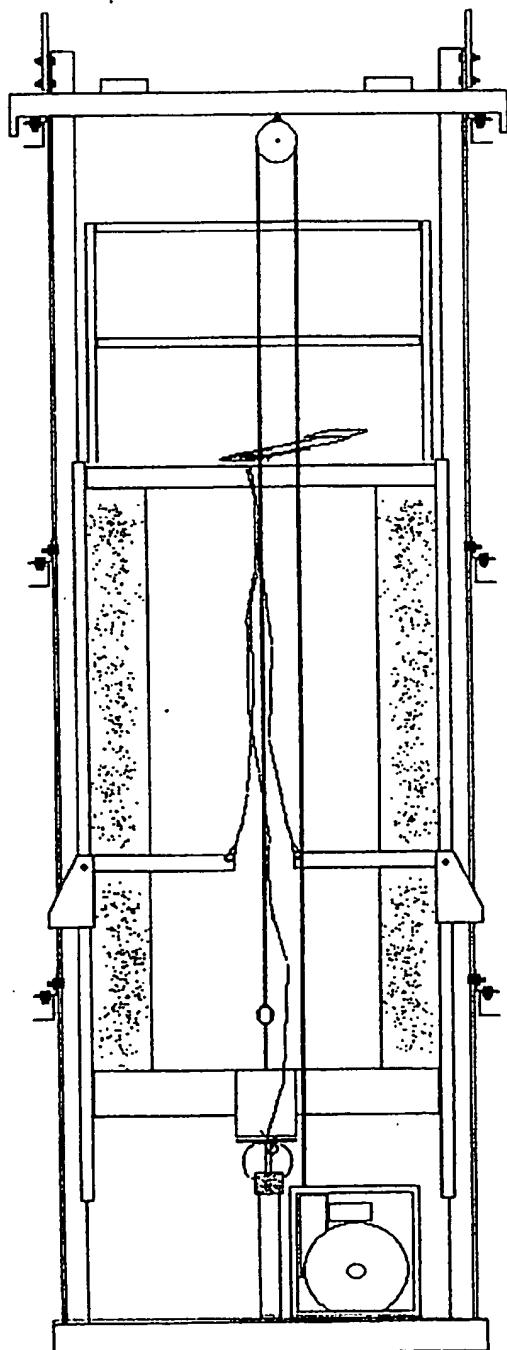


Fig. 20

Fig. 19



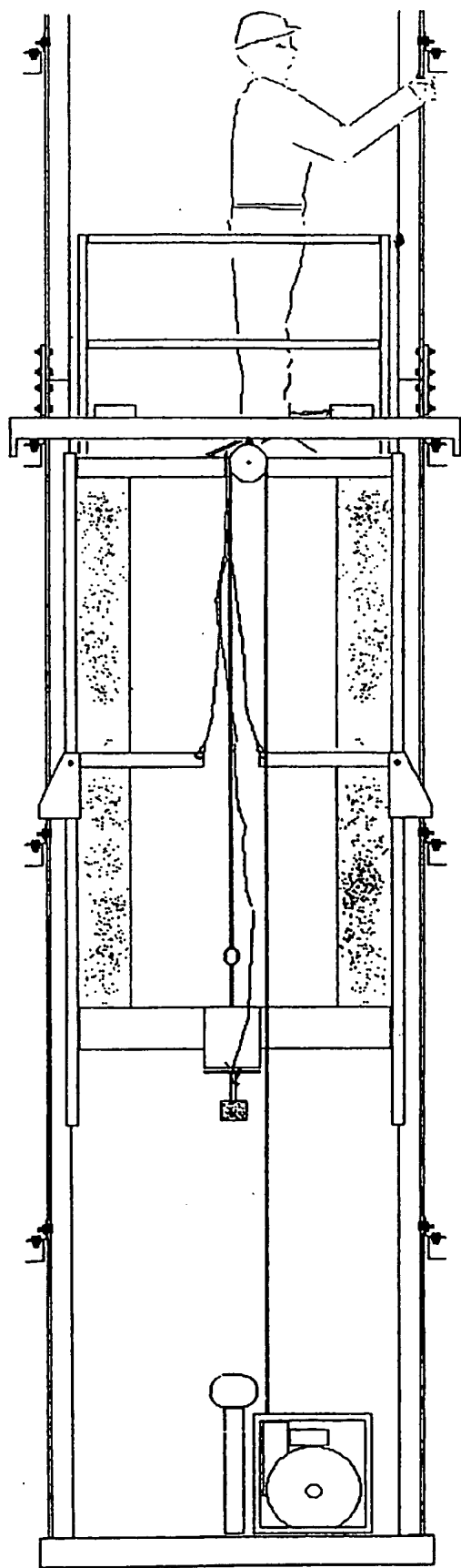


Fig. 21

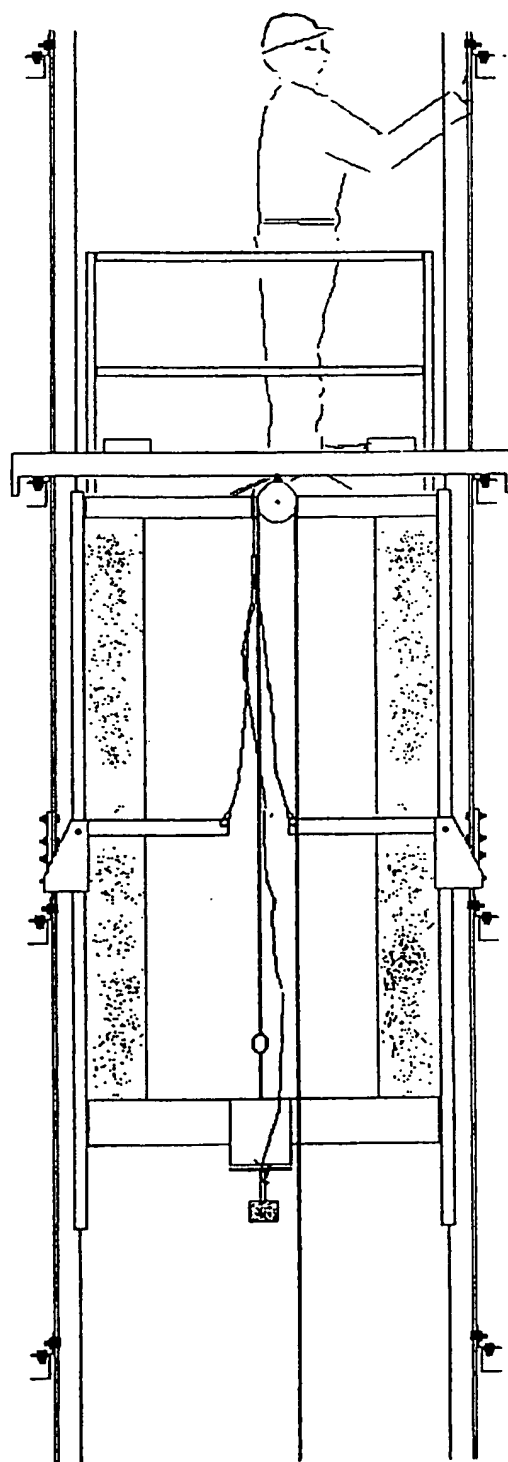


Fig. 22

INTERNATIONAL SEARCH REPORT

In tional Application No
PCT/IT 00/00506

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B66B19/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B66B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 464 312 A (OTIS ELEVATOR CO) 8 January 1992 (1992-01-08) abstract page 3, column 2, line 38 - line 47 page 4, column 3, line 52 - line 57 ---	1
A	EP 0 767 134 A (WITTUR AUFZUGTEILE GMBH & CO) 9 April 1997 (1997-04-09) abstract; figures 1,3 page 2, column 2, line 54 - line 59 page 3, column 4, line 23 - line 50 page 4, column 5, line 27 - line 31 --- -/--	1



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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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